U.S. GEOLOGICAL SURVEY
BRANCH OF ATLANTIC MARINE GEOLOGY
MEMORANDUM
27 Oct 1989

To: Aldrich, Butman, Knebel, Greatorex, Soderberg, Schwab, Sexton, Twichell
From: Jim Robb and Mike Bothner

Subject: Administrative Cruise Report:
Atlantis II Cruise 122, the DWD 106 Municipal Sludge Investigation, aka Crapper '89

1. Ship: R. V. Atlantis II (and DSRV Alvin, dives 2161-2167)

2. Cruise: 122

3. Parent Project: Fred Grassle's contract with NOAA's National Undersea Research Program

4. Funding Agency: NOAA, support funding from USGS for part of program

5. Area of Operations: Continental Rise offshore New Jersey and New York, environs Municipal Sludge dumpsite, DWD 106

6. Cruise start and end dates, ports:
16 Sep 1989-26 Sep 1989, Woods Hole-Woods Hole.

7. Chief Scientist: J. Fred Grassle, Rutgers University

8. Cruise Data Curator: none assigned

9. Scientific party:

From WHOI: Fred Grassle, Chief Scientist, Rose Petrecca, Hovey Clifford, Paul Snelgrove, Michael Moore
From USGS: Mike Bothner, Adam Brown, Ginger Fry, Rick Rendigs, Jim Robb, and Bill Strahle.
Other participants: Bob Whitlatch, UCONN, Russel Hill, and Ivor Knight, Univ of MD, Walter Sullivan, New York Times, Michael DeLuca, NOAA, Joyce Miller and Peter Lemmond, URI Seabeam group.

10. Ship's Captain: Gary Chiljean

11. Purpose of Cruise: To test the hypothesis that particles from

municipal sewage sludge disposal at Deep-water dumpsite 106 can be detected on the deep-sea floor in the vicinity of this dump site (2250 - 2750 m water depth). USGS objectives were to construct a detailed bathymetric map using Sea Beam (URI), deploy instruments to monitor currents and sediment transport, and to collect samples to evaluate rates of sediment mixing and accumulation and levels of chemical contaminants in surficial sediments.

Data acquired include a Sea Beam bathymetric map and digitally recorded depth data from a survey area of about 520 nmi^2, or about 1750 km^2), sediment samples from gravity cores and Alvin-manipulated corers (some cores were subsampled at sea), the usual video, camera, and audio descriptive data generated by ALVIN. Current-meter and sediment-trap data retrieval tentatively scheduled for RV Oceanus cruise in May 1990.

12. Navigation techniques:

Loran-C, supplemented by satellite. Bottom-transponder nets were established for Alvin navigation.

13. Scientific Equipment:

DSRV Alvin and support eqpt
Seabeam acquisition and processing equipment (WHOI and URI).
USGS-provided equipment includes 4 current meters with transmissometers, 4 Anderson-type and 7 tube-type sediment traps, gravity corer (4 in pvc barrels - system provided by J. Broda - WHOI), suspended sediment ("fluff") sampler for use with Alvin.

14. Tabulated Information:
    a. Days at Sea: 10
    b. Data and samples acquired (USGS responsibility):
        Seabeam contour map
        Gravity cores
        Alvin tube cores
        Bottom-water samples of resuspended sediments
        subsamples of other cores or samples
    (List of samples attached)

Appended:
Cruise personnel list
Track Chart
Locations of Alvin dives, Sampling stations, current meter-sediment trap arrays, and otter trawl and neuston tows.
Seabeam operation report (Joyce Miller, URI)
USGS Sample list.

R.V. Atlantis II

DEPART: WOODS HOLE, MA

U.S.A. FLAG / OFFICIAL NUMBER: MS 8201A

DATE: 15 SEPTEMBER 1989

VOYAGE 122 COASTWISE/GRASSLE

*** C R E W L I S T ***

NO.	NAME	RATING
1.	CHILJEAN, GARY B.	MASTER
2.	COLBURN, A.D. III	CHIEF OFFICER
3.	MARTIN, JOSEPH F.	SECOND OFFICER
4.	PASANEN, PATRICIA L.	THIRD OFFICER
5.	LAWTON, ERIN	MEDIC OFFICER
6.	COSTELLO, LAWRENCE P.	BOSUN
7.	DICKSON, CRAIG	A.B./DAYMAN
8.	BRODRICK, EDWARD R.	A.B.
9.	DAVIS, SALLYE A.	A.B.
10.	HALL, CECILE S.	A.B.
11.	HALEY, JAMES A.	O.S.
12.	LaPIERRE, JAMES J.	O.S.
13.	DeROCHE, MARK C.	O.S.
14.	McLAUGHLIN, BARRETT H.	CHIEF ENGR.
15.	MORRIS, RICHARD	1AE
16.	LITTLE, JEFFERY	2AE
17.	FISK, KEVIN C.	3AE
18.	BAUERLEIN, GUNTER H.	ELECTRICIAN
19.	TREADWELL, PHILIP M.	DECK ENGINEER
20.	WAGNER, HERMAN	OILER
21.	McBRIDE, WILLIAM	OILER
*22.	COLLASIUS, ALBERTO JR.	OILER
23.	CRONIN, MICHAEL H.	WIPER
24.	DUBE, ROGER J.	STEWARD
25.	WOOD, CARL O.	COOK
26.	MILLER, MIRTH N.	MESS ATTN.
27.	BARROS, JONATHAN W.	MESS ATTN.

ALVIN GROUP:

28.	FOSTER, DUDLEY B.	EXPED. LDR.
29.	HICKEY, PATRICK	PILOT
30.	TIBBETTS, PAUL D.	PILOT/R.O.
31.	TENGDIN, THOMAS T.	PILOT/R.O.
32.	ETCHEMENDY, STEPHEN A.	PILOT
33.	CONNORS, TIMOTHY J.	P.I.T
34.	VAN DOVER, CINDY L.	P.I.T.

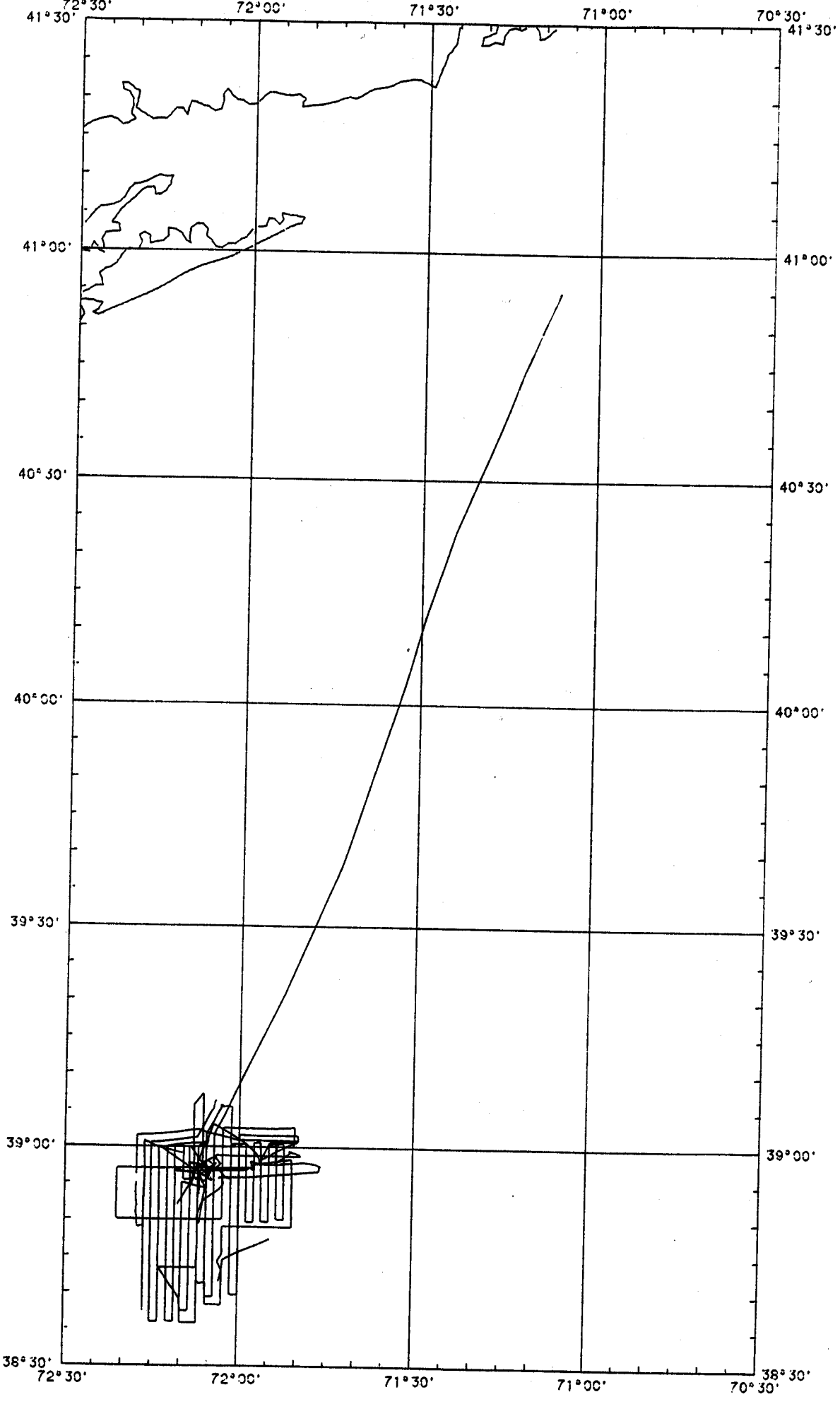
SCIENTIFIC CREW:

35.	GRASSLE, J. FREDERICK	CH. SCI.	RUTGERS UL.
36.	PETRECCA, ROSEMARIE	SCI. CREW	WHOI
37.	SNELGROVE, PAUL	SCI. CREW	WHOI
*38.	MOORE, MICHAEL J.	SCI.CREW	WHOI
39.	CLIFFORD, C. HOVEY	SCI. CREW	WHOI
40.	GARLAND, ELIZABETH D.	SCI. CREW	WHOI
41.	BROWN, ADAM R.	SCI. CREW	USGS
42.	BOTHNER, MICHAEL H.	SCI. CREW	USGS
43.	STRAHLE, WILLIAM J.	SCI. CREW	USGS
44.	RENDIGS, RICHARD	SCI. CREW	USGS
45.	FRY, VIRGINIA	SCI. CREW	USGS
46.	ROBB, JAMES M.	SCI. CREW	USGS
47.	WHITLATCH, ROBERT B.	SCI. CREW	U. of CT
48.	LEMMOND, PETER C.	SCI. CREW	U. of RI
49.	MILLER, JOYCE E.	SCI. CREW	U. of RI
50.	HILL, RUSSELL	SCI. CREW	U. of MD
51.	KNIGHT, IVOR T.	SCI. CREW	U. of MD
*52.	SULLIVAN, WALTER	SCI. CREW	NY TIMES
**53.	De LUCA, MICHAEL P.	SCI. CREW	NOAA

* = DISEMBARKED AT SEA 21 SEPT 89 TO F/V LITTLE APACHE II
** = EMBARKED AT SEA 21 SEPT 89 FROM F/V LITTLE APACHE II

21 SEPT 89 TOTALS: (26) SHIP CREW, (7) ALVIN GROUP, (17) SCIENTIFIC CREW = (50) P.O.B.

(CREW LIST UPDATED 21 SEPT 89 TO SHOW PERSONNEL CHANGES AT SEA)



Atlantis II Cruise 122
~~A121~~ September 15-26, 1989

Atlantis II Cruise 122 Sep 89

A122 Alvin Dives and Station Work

ALVIN DIVES		
Dive 2161A	38 56.970N	72 06.690W
Dive 2161B	38 57.080N	72 06.850W
Dive 2162A	38 58.100N	71 56.340W
Dive 2162B	38 57.790N	71 56.570W
Dive 2163A	38 56.030N	72 05.040W
Dive 2163B	38 55.940N	72 04.650W
Dive 2164A	38 55.720N	72 03.150W
Dive 2164B	38 55.710N	72 03.270W
Dive 2165A	38 57.140N	72 06.340W
Dive 2165B	38 56.450N	72 05.470W
Dive 2166	38 58.000N	71 56.340W
Dive 2167	38 49.330N	72 06.820W
BOX CORES		
BC 1,2,3	38 55.810N	72 02.750W
BC 4,5,6	39 05.640N	72 03.210W
BC 7	39 05.720N	72 03.340W
BC 8	38 55.880N	72 02.480W
BC 9,10	38 54.470N	72 07.530W
BC 11,12	38 51.160N	72 16.750W
BC 13	38 49.420N	72 06.810W
CURRENT METERS		
CM336	38 57.300N	72 05.620W
CM337	38 41.500N	72 06.990W
GRAVITY CORES		
GC 1	38 57.180N	72 06.160W
GC 2	38 57.090N	72 02.850W
GC 3	38 54.330N	72 07.570W
GC 4	38 48.590N	72 08.280W
NEWSTON TOWS		
NT 1	38 57.060N	72 05.810W
NT 2	38 56.830N	72 05.620W
NT 3	38 55.840N	72 05.090W
NT 4	38 56.110N	72 02.350W
NT 3A	38 57.020N	72 05.340W
NT 3B	38 57.370N	72 06.100W
NT 3C	38 57.550N	72 06.620W
NT 4A	38 56.900N	71 52.670W
NT 4B	38 57.180N	71 53.070W
NT 4C	38 57.710N	71 54.100W

Otter Trawl #1 Times
include 261-1989 05:00:00 to 261-1989 10:50:00

Otter Trawl #2 Times
include 263-1989 04:35:00 to 263-1989 10:00:00

Atlantis II Cruise 122 Seabeam Survey
Joyce Miller, URI

1 ~~A121~~ Cruise Report

1.1 Cruise Description

Cruise A121 was a study of the effect of primary sewage dumping from New York and New Jersey at DWD site #106. Current measurements, sediment and biological samples of a 25' x 25' area were made in addition to seven (out of a planned ten) Alvin dives. Sea Beam was run to survey the general area and for dive site and station selection. See the attached figure for survey location. The cruise departed from on September 15, 1989 and returned to Woods Hole on September 26, 1989.

1.2 Personnel

Dr. Fred Grassle of Woods Hole Oceanographic Institute was the chief scientist. In charge of the Sea Beam effort was Jim Robb from Woods Hole USGS. Joyce Miller was the primary Sea Beam technician for this one-person cruise. However, Peter Lemmond was also aboard working on the AII "turn-key" logging system.

1.3 Daily events

Date	Time	Events
9-14-89	1000L	Peter on board for cruise preparation
9-15-89	0800	Joyce arrives
	1000	Atlantis II departs Woods Hole
	1400Z	Begin navigation logging
	1410	Enter sound velocity profile #1
	1420	Test Sea Beam equipment
	1800	Begin Sea Beam data collection
9-16-89	0505	Arrive at survey site, begin Alvin Dive survey
	0948	End survey, steam to Alvin dive site 2161
	2150	Start Sea Beam
	2155	Begin survey
	2300	End survey
9-17-89	0015	Start survey line
	1230	Secure Sea Beam for Alvin Dive 2162
	2300	Enter SVP from Alvin Dive 2161
	2315	Start survey line
9-18-89	0440	End survey line
	0600	Otter trawl
	1230	Sea Beam on standby - Alvin Dive 2163
	2150	Begin Sea Beam survey
9-19-89	0020	N-S survey line suspended due to rough weather
	0400	Sea Beam off - Alvin Dive 2164
	1815	Begin Sea Beam survey
	2055	End survey
9-20-89	0026	Resume Sea Beam survey
	0330	End survey - Sea Beam still on for Otter Trawl

Date	Time	Events
	1224	Sea Beam off
	2130	Sea Beam on
	2156	Start survey
9-21-89	0340	Sea Beam off
	1015	Sea Beam on
	1029	Begin mini-survey-line
	1057	Eclipse crash
	1110	back on line
	1215	Secure Sea Beam for Alvin Dive 2165
	2130	Sea Beam on
	2225	Begin survey line
9-22-89	0351	End survey
	1302	Sea Beam on - no Alvin Dive - Hurricane Hugo
9-23-89	0022	Start Sea Beam survey
	0530	End of useful Sea Beam data
	0630	Stop Sea Beam - bad weather
	1420	Sea Beam on - weather & returns marginal
	1500	Sea Beam off
	1825	Start survey line, but Sea Beam was off
	1840	Sea Beam on
	2040	End survey line
	2125	Sea Beam off
9-24-89	0640	Sea Beam on, survey starts
	0800-0900	Three! Eclipse crashes
	1229	End survey line, transit to dive site
	1317	Sea Beam secured-end of survey
	1500	Alvin Dive 2166
9-25-89	1100	Alvin Dive 2167
	0200	Begin transit back to Woods Hole
9-26-89	1000L	Arrive Woods Hole

2 System Performance

On the previous cruise with Bill Ryan, the Sea Beam system was not operating correctly due to an incorrect roll factor in the General Instrument software. This problem was rectified on a test cruise and the Sea Beam worked well, except for four Eclipse crashes. In addition, rough weather due to Hurricane Hugo caused degraded returns when going into the seas for four days.

The CalComp plotter in the upper lab would not plot gridded maps without losing the origin. The pen block in the lower-lab CalComp is also suspect.

No other hardware problems were noted.

3 Software

The Naval Oceanographic Office software was used for the postprocessing system in order to test out the programs. In order to use the Navo plotting programs, it is necessary to use *CBSORT*. It was sometimes necessary to run *CBSORT* on raw and averaged file in order to get them to plot. This program (which was supplied by Navoceano) is not well-documented and seems to have alot of bugs floating around in it. It in some way changes the character of the Sea Beam data and certainly limits our software flexibility. It should not be propagated to other systems.

4 Data Processing

A limited area of 25' x 25' was surveyed around the primary dumping site. The LORAN in the area was very good and could be used for navigation with, in general, no further processing except averaging. There were small glitches in the data on two different days and these were removed. Because the navigation require minimal processing time, it was possible to grid the data aboard ship.

The data inventory is as follows:

Item	WHOI	USGS	Other	URI
TK50 tape				1
9-track 1600 BPI backup	1			
Swath plot books				4
Processing logs				10 pp.
8 1/2 x 11 track	1	1	1	1
Cruise report		1		3 pp.
LSR rolls				2
15"x22" gridded maps w/ stations	1	1		
30"x45" gridded maps w/ stations	2	2	1	1
30"x45" gridded maps	2	2	1	
30"x45" swath maps	2	2	1	1
30"x45" tracklines	1			1

Atlantis II Cruise 122 :

USGS Samples:

"Fluff" samples (Filters of resuspended bottom sediment)
Dive 2161 1 of 2
2161 2 of 2
2162
2163
2164
2165
2167

Suspended-matter samples:
Water with suspended sediment from above box core
BC Sta 6, Spade core 3 21-22 Sep

Station VB spade core 13 25 Sep
Station G spade core 1 from 8 subcores

47 mm filters--assorted collection from sediment resuspended above box cores and a few tube cores.

Xylem trachea samples (water):

Dive: 2162 water overlying core 2
2165 surface water
2165 water overlying core 6
2166 surface water
2166 water overflowing cut core
2 bottles of surface water at emergency-dump plume
2167 surface water
2167 water overlying core 5
2167 water overlying core 6

USGS Samples (cont.)
Sediment Samples:

Dives 2161-2167 Alvin 2" tube cores subsamples
Boxcores (all) subsamples

Alvin-dive samples:

Dive number	6" Diam. (Frozen)	Cores cut at sea	Small push cores
2161	9	yes	11,1,6,7,9,5,4
2162	1 (split in bbl)	2	6,4,5
2163	11	10	1,2,3,4 9 (cut for porosity)
2164	6	5	1,2,3,4
2165	6	#5	3,2,9,11
2166	5 (split in bbl)	#6	1,9
2167	6	#5	2,3,4

Box core subsamples

Station:	
F	rep 1 subcore 2; rep 1 subcore 16
G	rep 1 subcore 25;rep 2 subcore 25; rep 2 subcore 24; rep 4 subcore 24
3	subcore 25
6	rep 1; rep 2; rep 3 subcore 11
VB	rep 1 subcore 15, rep 1 subcore 20, rep 1 subcore 3 (Al container) rep 1 subcore 16
BC9	rep 1 subcore 24; rep 1, subcore 15

Gravity cores:

GC1 - whole core
GC2 - whole core (0-36 cm)
GC3 - whole core 2 sections
GC3 - sample between sections 1 & 2 bagged
GC3 - top 10 cm in overlapping red caps
GC4 - core catcher bagged
GC4 - whole core

Otter-trawl 1, subsamples: stones and semi-indurated fragments
cerianthid anemone tubes(?)